USER MANUAL

LCD 6~20Kva models

Uninterruptible Power Systems

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1.Safety and EMC instructions

Please read carefully the following user manual and the safety instructions before installing the unit or using the unit!

1.1 Installation

★ Condensation may occur if the UPS is moved directly from a cold to a warm environment. The UPS must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.

★ Do not install the UPS near water or in damp environment.

★ Do not install the UPS where it would be exposed to direct sunlight or near heat.

★ Do not block ventilation openings in the UPS's housing.

★ Do not connect appliances or items of equipment which would overload the UPS (e.g. laser printers, etc) to the UPS output.

★ Place cables in such a way that no one can step on or trip over them.

★ UPS has provided earthed terminal, in the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets.

★ An integral single emergency switching device which prevents further supply to the load by the UPS in any mode of operation should be provided in the building wiring installation.

★ An appropriate disconnect device as short-circuit backup protection should be provided in the building wiring installation.

★ For three-phase equipment connection to an IT power system, a four-pole device which disconnect all phase conductors and the neutral conductor should be provided in the building wiring installation.

★ This is permanently connected equipment , it must be installed by qualified maintenance personnel.

★ Earth connection essential before connecting to the building wiring terminal.

1.2 Operation

★ Do not disconnect the earth conductor cable on the UPS or the building wiring terminals in any time since this would cancel the protective earthing of the UPS system and of all connected loads.

★ The UPS output terminal block may be electrically lived even if the UPS system is not connected to the building wiring terminal.

★ In order to fully disconnect the UPS, first press the OFF button, then disconnect the mains lead.

★ Ensure that no liquid or other foreign objects can enter the UPS.

★ The UPS can be operated by any individuals with no previous experience.

1.3 Maintenance, servicing and faults

★ The UPS operates with hazardous voltages. Only qualified maintenance personnel may carry out repairs.

★ Caution - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring terminal), components inside the UPS are still connected to the battery, which are potentially dangerous.

★ Before carrying out any kind of service and/or maintenance, please disconnect the batteries. Verify that no current is present and no hazardous voltage exists in the capacitor or BUS capacitor terminals.

★ Batteries must be replaced only by qualified personnel.

★ Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is present before servicing!

★ Batteries have a high short-circuit current and pose a risk of shock. Take all precautionary measures specified below and any other measures necessary when working with batteries:

- remove all jewellery, wristwatches, rings and other metal objects.
- use only tools with insulated grips and handles.

★ When changing batteries, replace with the same quantity and the same type of batteries.

★ Do not attempt to dispose of batteries by burning them. It could cause explosion.

★ Do not open or destroy batteries. Effluent electrolyte can cause injury to the skin and eyes. It may be toxic.

★ Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.

★ Do not dismantle the UPS, except the qualified maintenance personnel.

1.4 Transport

★ Please transport the UPS only in the original packaging (to protect against shock and impact).

1.5 Storage

★ The UPS must be stockpiled in the room where it is ventilated and dry.

1.6 Standards

*** Safety**	
IEC/EN 62040-1-1	
*** EMI**	
Conducted Emission.....:IEC/EN 62040-2	Category C3
Radiated Emission.....:IEC/EN 62040-2	Category C3
***EMS**	
ESD.....:IEC/EN 61000-4-2	Level 4
RS.....:IEC/EN 61000-4-3	Level 3
EFT.....:IEC/EN 61000-4-4	Level 4
SURGE.....:IEC/EN 61000-4-5	Level 4
Low Frequency Signals.....:IEC/EN 61000-2-2	
Warning: This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.	

2. Description of commonly used symbols

Some or all of the following symbols may be used in this manual. It is advisable to familiarize yourself with them and understand their meaning:

Nation and Explanation			
Nation	**Explanation**	**Nation**	**Explanation**
⚠	Alert you to pay special attention	⏚	Protective ground
⚠	Caution of high voltage		Alarm silence
|	Turn on the UPS		Overload indication
○	Turn off the UPS	⊣⊢	Battery
⏻	Idle or shut down the UPS		Recycle
~	Alternating current source (AC)		Do not dispose with ordinary trash
⎓	Direct current source (DC)		

3. Introduction

3.1 System and model description

This Online Series is an uninterruptible power supply incorporating double-conversion technology. It provides perfect protection specifically for computer equipment, communication systems to computerized instruments.

Its true online double-conversion design eliminates all mains power disturbances. A rectifier converts the alternating current from the utility power to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a pure sinusoidal AC voltage, which is constantly powering the loads.

Computers and Peripherals are thus powered entirely by the UPS. In the event of power failure, the maintenance-free batteries power the inverter.

This manual is applicable to the following models:

Model No.	Type
6K	Standard
10K	
6KS	Long backup time
10KS	
3T1 10KS	
3T1 15KS	
3T1 20KS	

"S" Model: Long backup time

3.2 Product Specification and Performance

1) General Specification

Model		6K	6KS	10K	10KS	3T1 10KS	3T1 15KS	3T1 20KS
Power Rating		6KVA/4.2KW		10KVA/7KW		10KVA/7KW	15KVA/10.5KW	20KVA/14KW
Frequency (Hz)		50/60		50/60		50/60	50/60	50/60
Input	Voltage	(176-276)VAC		(176-276)VAC		(304-478)VAC	(304-478)VAC	(304-478)VAC
	Current	32A max.		50A max		50A max	75A max	100A max
Battery	Voltage	240VDC		240VDC		240VDC	240VDC	240VDC
	Current	24A max		40A max		40A max	60A max	80A max
Output	Voltage	208/220/230/240VAC						
	Current	26/27/26/25A		43/45/43/42A		43/45/43/42A	65/68/65/63A	87/91/87/83A
Dimension (WxDxH) mm		260x570x717		260x570x717		260x570x717	260x570x717	260x570x717
Weight (kg)		90	35	93	38	39	55	55

2) Electrical Performance

Input			
Model	Voltage	Frequency	Power Factor
6K(S)/10K(S)	Single-phase	46-54Hz/ 56-64Hz	>0.98 (Full load)
3T1 10KS/15KS/20KS	Three-phase	46-54Hz/ 56-64Hz	>0.95 (Full load)

Output					
Voltage Regulation	Power Factor	Frequency tolerance.	Distortion	Overload capacity	Current crest ratio
±1%	0.7 lag	Synchronized 46-54Hz/ 56-64Hz in Line mode (AC mode) ±0.1% of normal frequency in Battery mode	THD<2% Full load (Linear Load)	105%-130% load transfers to Bypass mode after 10 minutes >130% load transfers to Bypass mode after 1 second and shutdown the output after 1 minute	3:1 maximum

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	Current	32A max.		50A max		50A max	75A max	100A max
Battery	Voltage	240VDC		240VDC		240VDC	240VDC	240VDC
	Current	24A max		40A max		40A max	60A max	80A max
Output	Voltage	208/220/230/240VAC						
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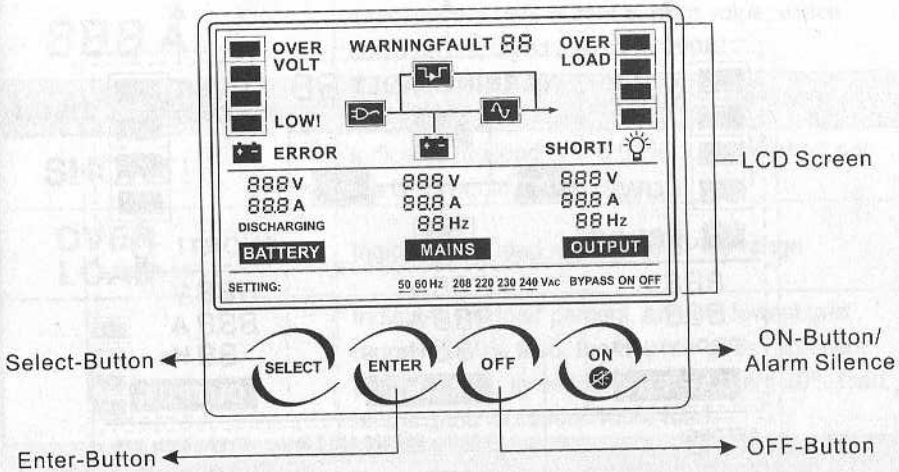
3) Operating Environment

Temperature	Humidity	Altitude	Storage temperature
0°C-40°C	<95%	<1000m	0°C-40°C

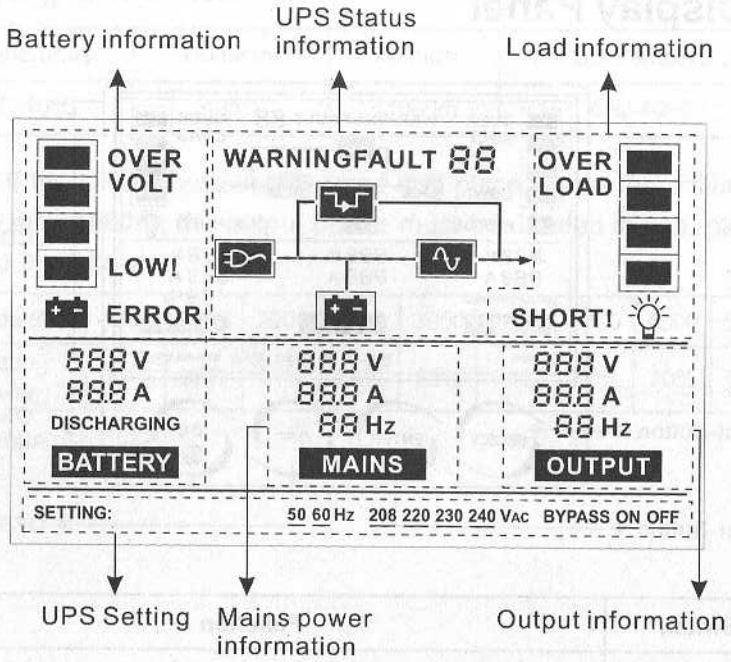
Note: if the UPS is installed or used in a place where the altitude is above than **1000m**, the output power must be derated in use, please refer to the following:

Altitude (M)	1000	1500	2000	2500	3000	3500	4000	4500	5000
Derating Power	100%	95%	91%	86%	82%	78%	74%	70%	67%

4. Display Panel



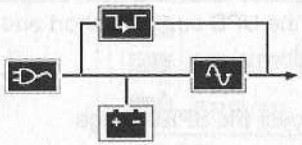
Switch	Function
ON-Button	Turn on UPS system: By pressing the ON-Button, the UPS system is turned on. Deactivate acoustic alarm: By pressing this Button an acoustic alarm can be deactivated.
OFF-Button	When mains power is normal, the UPS system switches to No output or Bypass mode by pressing OFF-Button, and the inverter is off. At this moment, if Bypass is enabled, then the output sockets are supplied with voltage via the bypass if the mains power is available.
Select-Button	If the UPS system is No output or Bypass mode, the output voltage and frequency and Bypass disable/enable could be selected by pressing Select-Button, and confirmed by pressing Enter-Button.
Enter-Button	If the UPS system is No output or Bypass mode, the output voltage and frequency and Bypass disable/enable could be selected by pressing Select-Button, and confirmed by pressing Enter-Button.



The LCD Display

Display	Function
Mains power Information *	
888 V	Indicates the input voltage value, which could be displayed from 0 to 999Vac
88 Hz	Indicates the frequency value of input voltage, which could be displayed from 0 to 99Hz
88.8 A	Indicates the input current value, which could be displayed from 0 to 999A
Output Information	
888 V	Indicates the UPS output voltage value, which could be displayed from 0 to 999Vac

88 Hz	Indicates the frequency value of the UPS output voltage, which could be displayed from 0 to 99Hz
88.8 A	Indicates the UPS output current value, which could be displayed from 0 to 999A
Load Information	
SHORT!	Indicates the load or the UPS output is short and the UPS would shut down
OVER LOAD	Indicates the load is over the SPEC range
	Indicates the load percent, and the lowest grid represent 30% load, the two low grids represent 60% load, the three low grids represent 90% load, all the grids represent 100% load.
Battery Information	
888 V	Indicates the battery voltage value, which could be displayed from 0 to 999Vdc
88.8 A	Indicates the battery current value, which could be displayed from 0 to 999A
	Indicates the battery capacitance percent, and every grid represent 25% capacitance. All the grids represent 100% capacitance.
CHARGING	Indicates the charger of UPS is working and the battery is being discharged.
DISCHARGING	Indicates the charger of UPS is not working.
OVER VOLT	Indicates the battery is over charged, and the UPS would be switched to Battery mode
LOW!	Indicates the battery is weak, and the UPS would shut down soon

UPS status Information	
88	Indicates the status of the UPS, Fault/Warning code or the quantity of the parallel system could be displayed, and the codes are illuminated in detail in the following chapter
	Indicates the operating mode of the UPS in graphics mode. The will be displayed when the mains power is normal; The will be displayed when the UPS is working in bypass mode; The will be displayed when the UPS is working in battery mode; The will be displayed when the inverter is working normal.
FAULT	Indicates the UPS is working in fault mode.
WARNING	Indicates some warnings occur which need be attention.
UPS setting Information	
208 220 230 240 VAC	The four value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time.
50 60 Hz	The two frequency value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time
BYPASS ON OFF	Bypass disable or enable could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time

* **Notes:** For 3T1 10KS UPS, only the information of phase C will be shown; while for 3T1 15KS/20KS UPS, only the information of phase A will be shown.

5. Installation

The system may be installed and wired only by qualified electricians in accordance with applicable safety regulations!

5.1 Unpacking and Inspection

1) Unpack the packaging and check the package contents. The shipping package contains:
   - A UPS
   - A user manual
   - A communication cable
   - A battery cable (for 6KS/10KS/3T1 10KS only)
2) Inspect the appearance of the UPS to see if there is any damage during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts.

5.2 Input and output power cords and protective earth ground installation

1. Notes for installation

1) The UPS must be installed in a location with good ventilation, far away from water, inflammable gas and corrosive agents.
2) Ensure the air vents on the front and rear of the UPS are not blocked. Allow at least 0.5m of space on each side.
3) Condensation to water drops may occur if the UPS is unpacked in a very low temperature environment. In this case it is necessary to wait until the UPS is fully dried inside out before proceeding installation and use. Otherwise there are hazards of electric shock.

2. Installation

Installation and wiring must be performed in accordance with the local electric code and the following instructions by professional personnel.

For safety, please cut off the mains power switch before installation. The battery breaker also needs to be cut off if it is a long backup time model ("S" model).

1) Open the terminal block cover located on the rear panel of the UPS, please refer to the appearance diagram.
2) For 6K(S) UPS, it is recommended to select the UL1015 10AWG(6mm^2) wire or other insulated wire which complies with AWG Standard for the UPS input and output wirings.
3) For 10K(S)/3T1 10KS UPS, it is recommended to select the UL1015 8AWG(10mm^2) wire or other insulated wire which complies with AWG Standard for the UPS input and output wirings.
4) For 3T1 15KS /20KS UPS, it is recommended to select the UL1015 6AWG(25mm^2) wire or other insulated wire which complies with AWG Standard for the UPS input and output wirings.

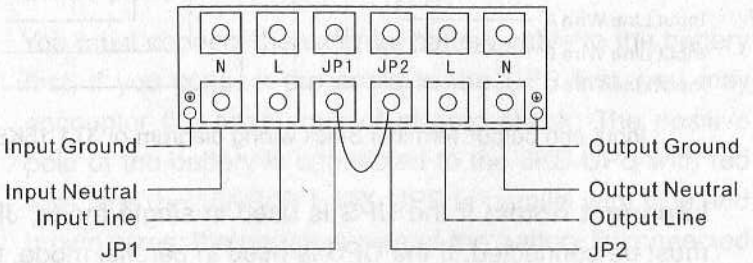
Note: Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS's maximum input current. Otherwise the receptacle may be burned and destroyed.

5) Connect the input and output wires to the corresponding input and output terminals according to the following diagram.

Note: you must make sure that the input and output wires and the input and output terminals are connected tightly.

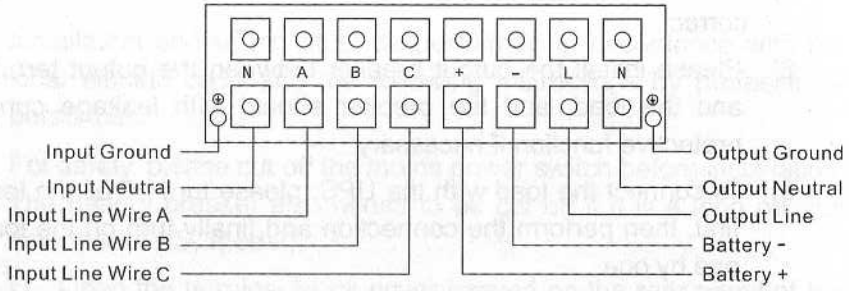
6) The protective earth ground wire refers to the wire connection between the equipment which consumes electric equipment and the ground wire. The wire diameter of protective earth ground wire should be at least as above mentioned for each model and green wire or green wire with yellow ribbon wire is used.

7) After having completed the installation, make sure the wiring is correct.
8) Please install the output breaker between the output terminal and the load, and the breaker should with leakage current protective function if necessary.
9) To connect the load with the UPS, please turn off all the loads first, then perform the connection and finally turn on the loads one by one.
10) No matter the UPS is connected to the utility power or not, the output of the UPS may have electricity. The parts inside the unit may still have hazardous voltage after turning off the UPS. To make the UPS have no output, power off the UPS, and then disconnect the utility power supply.
11) Suggest charging the batteries for 8 hours before use. After connection, turn the input breaker in the "ON" position, the UPS will charge the batteries automatically. You can also use the UPS immediately without charging the batteries first, but the backup time may be less than the standard value.
12) If it is necessary to connect the inductance load such as a monitor or a laser printer to the UPS, the start-up power should be used for calculating the capacity of the UPS, as its start-up power consumption is too big when it is started.



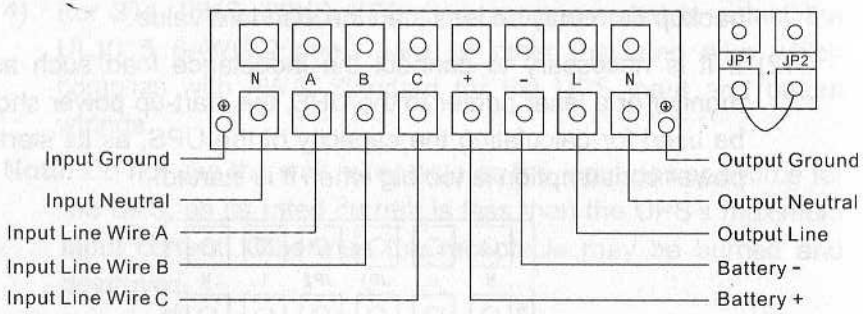
Input and output Terminal Block wiring diagram of 6K(S)/10K(S)

Important notes: If the UPS is used in single mode, JPI and JP2 must be connected by 10AWG(6mm^2). If the UPS is used in parallel mode, JP1 and JP2 must be disconnected.



Input and output Terminal Block wiring diagram of 3T1 10KS

Important notes: If the UPS is used in single mode, JPI and JP2 must be connected by 10AWG(6mm^2). If the UPS is used in parallel mode, JP1 and JP2 must be disconnected.



Input and output Terminal Block wiring diagram of 3T1 15KS/20KS

Important notes: If the UPS is used in single mode, JPI and JP2 must be connected. If the UPS is used in parallel mode, the Jumper between JP1 and JP2 must be removed.

5.3 Operating procedure for connecting the long backup time model UPS with the external battery

1. The nominal DC voltage of external battery pack is 240VDC. Each battery pack consists of 20 pieces of 12V maintenance free batteries in series. To achieve longer backup time, it is possible to connect multi-battery packs, but the principle of "same voltage, same type" should be strictly followed.

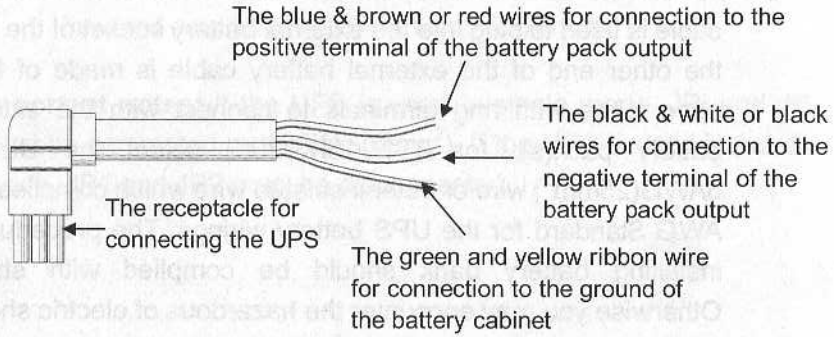
2. For 6KS/10KS/3T1 10KS, the connector of the external battery cable is used to plug into the external battery socket of the UPS, the other end of the external battery cable is made of three open wires with ring terminals to connect with the external battery pack(s); for 3T1 15KS/20K, select the UL1015 6AWG(25mm^2) wire or other insulated wire which complies with AWG Standard for the UPS battery wirings. The procedure of installing battery bank should be complied with strictly. Otherwise you may encounter the hazardous of electric shock.

   1) A DC breaker must be connected between the battery pack and the UPS. The capacity of breaker must be not less than the data specified in the general specification.

   2) Set the battery pack breaker in "OFF" position and connect the 20 pieces of batteries in series.

   3) You must connect the external battery cable to the battery first, if you connect the cable to the UPS first, you may encounter the hazardous of electric shock. The positive pole of the battery is connected to the 6KS UPS with red wire, and the 10KS/3T1 10K UPS in parallel with blue and brown wires; the negative pole of the battery is connected to the 6KS UPS with black wire, and the 10KS/3T1 10K UPS in parallel with black and white wires; the green and yellow ribbon wire is connected to the ground of the battery cabinet.

3. To complete the connection by plugging the connector of the external battery cable into the external battery socket of the UPS. Do not attempt to connect any loads to the UPS now. You should connect the input power wire to the right position first. And then set the breaker of the battery pack in the "ON" position. After that set the input breaker in the "ON" position. The UPS begins to charge the battery packs at the time.


The blue & brown or red wires for connection to the positive terminal of the battery pack output
The black & white or black wires for connection to the negative terminal of the battery pack output
The receptacle for connecting the UPS
The green and yellow ribbon wire for connection to the ground of the battery cabinet

5.4 Parallel operation

1. Brief introduction of the redundancy

N+X is currently the most reliable power supply structure. N represents the minimum UPS number that the total load needs; X represents the redundant UPS number, i.e. the fault UPS number that the system can handle simultaneously. The bigger the X is, the higher reliability of the power system is. For occasions where reliability is highly depended on, N+X is the optimal mode.

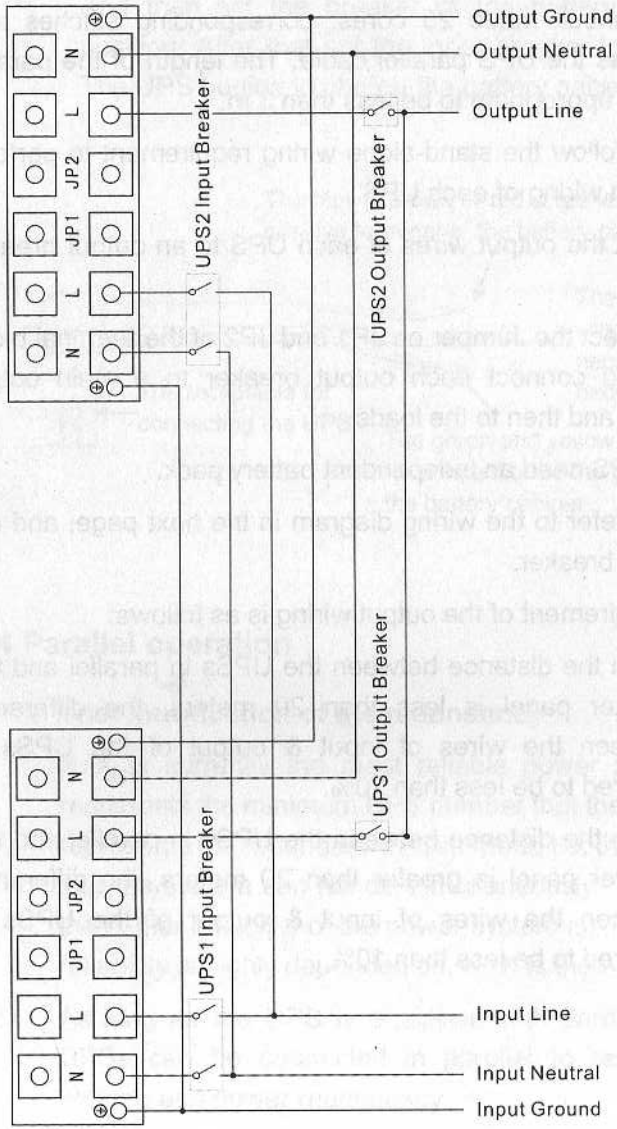
As long as the UPS is equipped with parallel cables, up to 3 UPSs can be connected in parallel to realize output power sharing and power redundancy.

2. Parallel installation

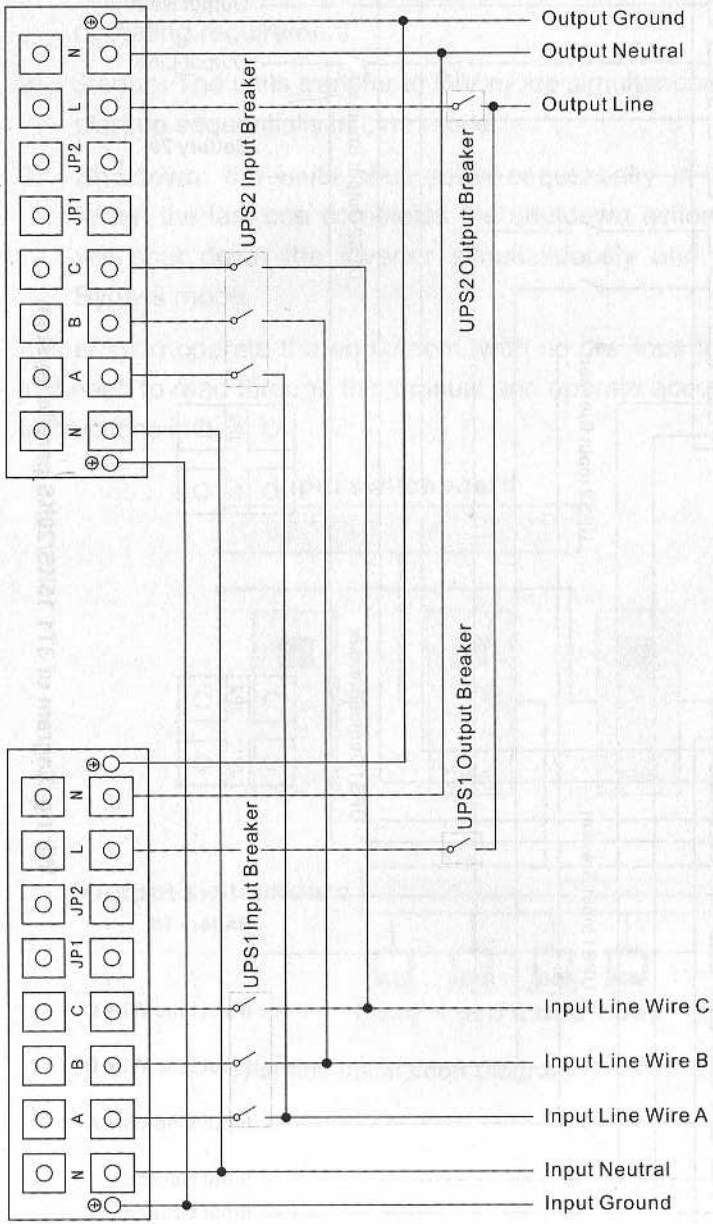
1) Users need to opt a standard 25-pin communication cable, which should have 25 cores, corresponding stitches and shield, as the UPS parallel cable. The length of the parallel cable is appropriate to be less than 3 m.
2) Strictly follow the stand-alone wiring requirement to perform the input wiring of each UPS.
3) Connect the output wires of each UPS to an output breaker panel.
4) Disconnect the Jumper on JP1 and JP2 of the terminal block first, and connect each output breaker to a main output breaker and then to the loads.
5) Each UPS need an independent battery pack.
6) Please refer to the wiring diagram in the next page, and opt suitable breaker.

■ The requirement of the output wiring is as follows:

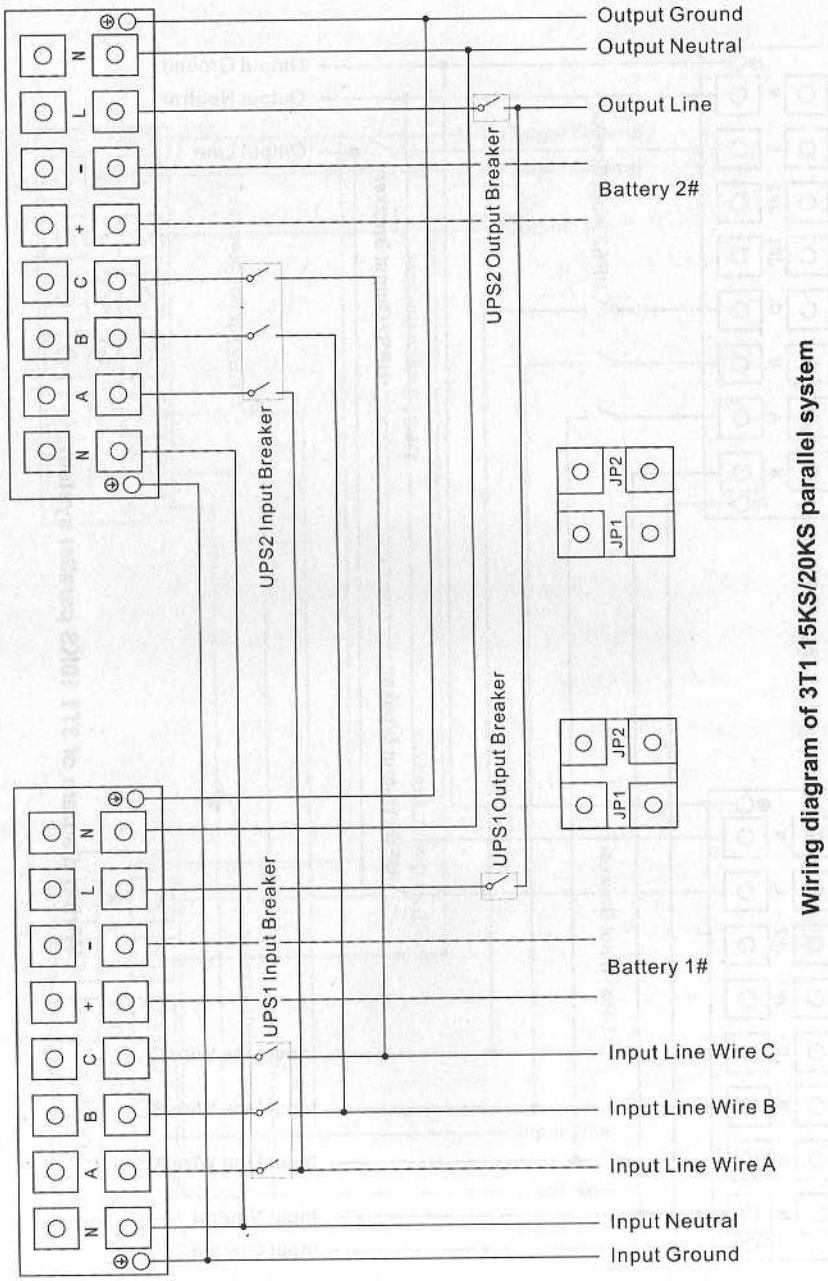
- When the distance between the UPSs in parallel and the breaker panel is less than 20 meters, the difference between the wires of input & output of the UPSs is required to be less than 20%.
- When the distance between the UPSs in parallel and the breaker panel is greater than 20 meters, the difference between the wires of input & output of the UPSs is required to be less than 10%.



Wiring diagram of 6K(S)/10K(S) parallel system



Wiring diagram of 3T1 10KS parallel system

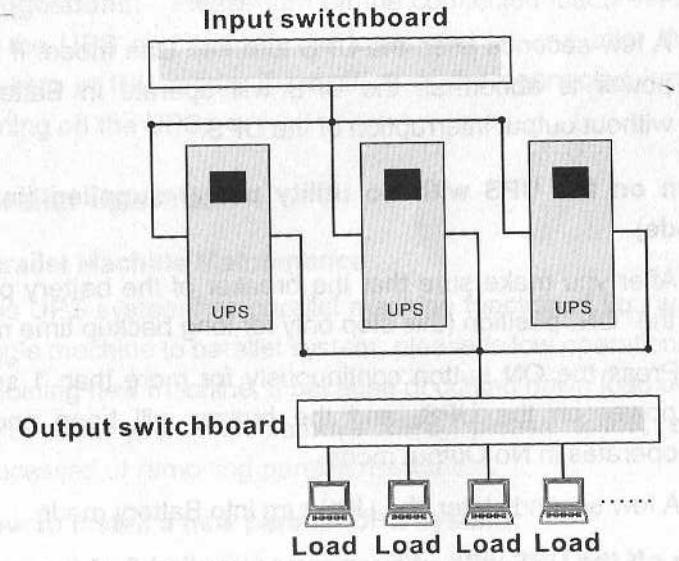


Wiring diagram of 3T1 15KS/20KS parallel system

3. Operation and maintenance

1) To perform the general operation, follow the stand-alone operating requirement.
2) Startup: The units transfer to INV mode simultaneously as they start up sequentially in Line mode.
3) Shutdown: the units shut down sequentially in INV mode. When the last one completes the shutdown action, each unit will shut down the inverter simultaneously and transfer to Bypass mode.

It is easy to operate the equipment, with no previous training. You just need to read through this manual and operate according to the instructions in it.



Parallel Installation Diagram

6. Operation

6.1 Operation Mode

1. Turn on the UPS with utility power supplied (in Line mode)

1) After you make sure that the power supply connection is correct, and then set the breaker of the battery pack in the "ON" position (this step only for long backup time model), after that set the input breaker in the "ON" position. At this time the fan rotates and the UPS supplies power to the load via the bypass. The UPS operates in Bypass mode.
2) To power on the UPS by simply pressing the ON button continuously for more than 1 second, the buzzer will beep once.
3) A few seconds later, the UPS turn into Line mode. If the utility power is abnormal, the UPS will operate in Battery mode without output interruption of the UPS.

2. Turn on the UPS with no utility power supplied (in Battery mode)

1) After you make sure that the breaker of the battery pack is in the "ON" position (this step only for long backup time model).
2) Press the ON button continuously for more than 1 second to power on the UPS, and the buzzer will beep once, UPS operates in No Output mode.
3) A few seconds later, the UPS turn into Battery mode.

3. Turn off the UPS with utility power supplied (in Line mode)

1) To turn off the inverter of the UPS by pressing the OFF button continuously for more than 1 second, and the buzzer will beep once. The UPS will turn into Bypass mode.

2) Upon completion of the above to turn it off, output of electric current of the UPS is still present. In order to cut off the output from the UPS, simply cut off the utility power supply, a few seconds later, there are not any display is shown on the display panel and no voltage output is available from the UPS output.

4. Turn off the UPS with no utility power supplied (in Battery mode)

1) To power off the UPS by pressing the OFF button continuously for more than 1 second, and the buzzer will beep once.
2) When being powered off, the UPS will turn into No Output mode. Finally not any display is shown on the display panel and no voltage is available from the UPS output.

Suggestions: Please turn off the connected loads before turning on the UPS and turn on the loads one by one after the UPS is working in INV mode. Turn off all of the connected loads before turning off the UPS.

6.2 Parallel Operation

1. Parallel Machine Maintenance

This UPS system has parallel machine function, if you want to add single machine to parallel system, please follow operational process of joining new machine; if because of cutting down load or attainting UPS, and you must remove UPS, please follow operational processes of removing parallel machine.

2. How to install a new parallel UPS system:

1) Before installing a new parallel UPS system, user need to prepare the input and output wires, the output breaker, and the parallel cable.
2) Turn off the input and output breakers of each UPS. Connect the input wires, output wires and battery wires. Remove the

short connection wire between JP1 and JP2 on the terminal block. Remove the maintenance cover board of each UPS and set the maintenance switch from "UPS" to "BPS".

3) Remove the cover board of the parallel port on the UPS, connect each UPS one by one with the parallel cable, screw the cover board of the parallel port back again.

4) Turn on the battery switch and the input breaker of the each UPS, measure the difference voltage between the output line wires of each UPS to check if the voltage difference between them is less than 1V. If the difference is less than 1V, close the output breaker. If the difference is more than 1V, check if the wirings are abnormal.

5) Close the input breakers of all of the UPSs in the parallel system. After all of the UPSs transfer to the Bypass mode, screw the maintenance cover board back again.

6) Turn on each UPS in turn and observe their display. Make sure that each UPS displays normal and all the UPSs transfer to the INV mode together. Measure the voltage on the JP1 and JP2 on the terminal block of each UPS to check if the voltage difference between them is less than 1V. If the voltage difference is more than 1V, the output relay of the UPS may not be closed.

7) Measure the voltage of each JP2 on each UPS to check if the voltage value is less than 5V (Generally 2V). If the difference is more than 5V, that means the UPS needs to be regulated again or you need to check that the parallel cable of the parallel kit are normal.

8) Turn off each UPS in turn and after all of them transfer to the Bypass mode, remove the maintenance cover board of each UPS and set the maintenance switch from "BPS" to "UPS" and screw the maintenance cover board back again.

9) Turn on the UPSs in the Line mode to perform the parallel operation.

3. How to join a new UPS:

1) Before joining a new UPS, user need to prepare the input and output wires, the output breaker, and the parallel cable.

2) Turn off the input and output breakers of the new unit. Connect the input wires, output wires and battery wires. Remove the short connection wire between JP1 and JP2 on the terminal block.

3) Turn off the UPS systems that are running. After all of the running UPSs transfer to the Bypass mode, remove the maintenance cover board of each UPS and set the maintenance switch from "UPS" to "BPS", then turn off the input breaker of each UPS.

4) If the UPS system that is running is a stand-alone UPS, you need to remove the short connection wire between JP1 and JP2 on the terminal block.

5) Remove the cover board of the parallel port on the new UPS, push one end of the parallel cable into the slot of the parallel kit and screw up the connector; screw the cover board of the parallel port back again.

6) Remove the maintenance cover board of the new UPS and set the maintenance switch from "UPS" to "BPS".

7) Turn on the battery switch and the input breaker of the new UPS; measure the difference voltage between the output line wires of new UPS and the parallel system to check if the voltage difference between them is less than 1V. If the difference is less than 1V, close the output breaker. If the difference is more than 1V, check if the wirings are abnormal.

8) Remove the cover board of the parallel port located on the UPS which has transferred to the maintenance bypass and push the other end of the parallel cable into the slot of the parallel kit and fasten the connector. Screw the cover board of the parallel port back again.

9) Close the input breakers of all of the UPSs (including the new UPS) in the parallel system. After all of the UPSs transfer to the Bypass mode, screw the maintenance cover board back again.

10) Turn on each UPS in turn and observe their display. Make sure that each UPS displays normal and all the UPSs transfer to the INV mode together. Measure the voltage on the JP1 and JP2 on the terminal block of each UPS to check if the voltage difference between them is less than 1V. If the voltage difference is more than 1V, the output relay of the UPS may not be closed.

11) Measure the voltage of each JP2 on each UPS to check if the voltage value is less than 5V (Generally 2V). If the difference is more than 5V, that means the new UPS needs to be regulated again or you need to check that the parallel cable of the parallel kit are normal.

12) Turn off each UPS in turn and after all of them transfer to the Bypass mode, remove the maintenance cover board of each UPS and set the maintenance switch from "BPS" to "UPS" and screw the maintenance cover board back again.

13) Turn on the UPSs in the Line mode to perform the parallel operation.

Note: If the UPS is abnormal in the above debugging, please perform maintenance according to the steps of removing a stand-alone.

4. How to remove a single UPS from the parallel system:

1) If you need to remove one UPS of the UPSs parallel system which is on normal running, press the OFF button of the UPS that is confirmed to be removed twice continuously and the UPS will cut off its output immediately.

2) Turn off the input breaker, the external mains input breaker, the output breaker and the battery switch of the UPS that will be removed.

3) Press the others UPSs's OFF button. After all of them transfer to the Bypass mode, remove the cover board of each UPS and set the maintenance switch from "UPS" to "BPS" and then turn off the input breaker of each UPS.

4) After you remove one UPS, you need to connect the short connection wire of the JP1 and JP2 located on the Terminal block of the UPS if the remained UPS system only remain one UPS runs by itself

5) After all panels of the UPSs do not display anything any more, remove the cover board of the parallel port on the UPS connected with the parallel cable of the UPS that need to be removed. Remove the parallel cable and screw the cover board of the parallel port back again.

6) Remove the cover board of the parallel port located on the UPS that need to be removed and remove the parallel cable, and then screw the cover board back again.

7) Close all of the input mains breakers of the remained UPSs. After all UPSs transfer to the Bypass mode, set the UPS maintenance switch from "BPS" to "UPS" and screw the maintenance cover board back again. Then turn on all of the UPSs in the Line mode to perform the parallel operation.

8) If the removed UPS will be used in a stand-alone mode, then JP1 and JP2 on the terminal block should be connected with a short connection wire.

- **Combine machine warning:**

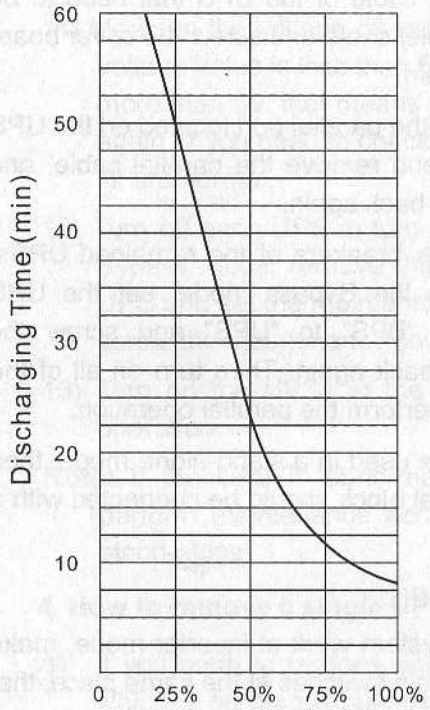
  1) When UPS combine system work at inverter mode, make sure that all UPS maintain switches at the same place, that is to say, be at the position of "UPS", or be at the position of "BPS".

  2) When turning on the UPS combine system before enter into inverter mode, UPS output switch must at the "OFF" position.

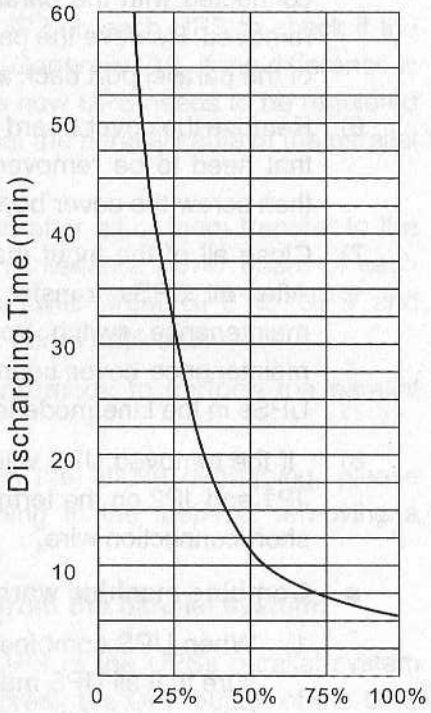
  3) When UPS combine system work at inverter model, please do not operate any UPS maintain switch.

6.3 Backup time for the standard model

The backup time of the long backup time model is dependent on the external battery pack capacity and the load level as well as other factors. The backup time of standard model may vary from different models and load level. Please refer to the following:



Load level
Backup time of 6K



Load level
Backup time of 10K

7. Battery Maintenance

- This series UPS only requires minimal maintenance. The battery used for standard models are value regulated sealed lead-acid maintenance free battery. These models require minimal repairs. The only requirement is to charge the UPS regularly in order to maximize the expected life of the battery. When being connected to the utility power, whether the UPS is turned on or not, the UPS keeps charging the batteries and also offers the protective function of overcharging and over-discharging.
- The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
- In the regions of hot climates, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.
- Under normal conditions, the battery life lasts 3 to 5 years. In case if the battery is found not in good condition, earlier replacement should be made. Battery replacement should be performed by qualified personnel.
- Replace batteries with the same number and same type of batteries.
- Do not replace the battery individually. All the batteries should be replaced at the same time following the instructions of the battery supplier.
- Normally, the batteries should be charged and discharged once every 4 to 6 months. Charging should begin after the UPS shuts down automatically in the course of di scharging, the standard charging time for the standard UPS should be at least 12 hours.

8. Notes for Battery Disposal and Battery Replacement

1) Before disposing of batteries, remove conductive jewelry such as necklace, wristwatches and rings.
2) If it is necessary to replace any connection cables, please purchase the original materials from the authorized distributors or service centers, so as to avoid overheat or spark resulting in fire due to insufficient capacity.
3) Do not dispose of batteries or battery packs in a fire, they may explode.
4) Do not open or mutilate batteries, released electrolyte is highly poisonous and harmful to the skin and eyes.
5) Do not short the positive and negative of the battery electrode, otherwise, it may result in electric shock or fire.
6) Make sure that there is no voltage before touching the batteries. The battery circuit is not isolated from the input potential circuit. There may be hazardous voltage between the battery terminals and the ground.
7) Even though the input breaker is disconnected, the components inside the UPS are still connected with the batteries, and there are potential hazardous voltages. Therefore, before any maintenance and repairs work is carried out, switch off the breaker of the battery pack or disconnect the jumper wire of connecting between the batteries.
8) Batteries contain hazardous voltage and current. Battery maintenance such as the battery replacement must be carried out by qualified personnel who are knowledgeable about batteries. No other persons should handle the batteries.

9. Trouble Shooting

Problem	Possible cause	Solution
The Fault code is "08", and the buzzer beeps continuously.	The UPS transfers to fault mode due to internal overheat.	Make sure the UPS is not overloaded; the air vents are not blocked and the ambient temperature is not too high. Wait for 10 minutes for the UPS to cool down before turning on again. If failed, please contact the distributor or service center.
The Fault code is "09", and the buzzer beeps continuously.	The UPS output is short circuited.	Remove all the loads. Turn off the UPS. Ensure that the load is not failed or the UPS has no internal faults before turning it on again. If failed, please contact the distributor or service center.
The Fault code is "05" or "06", the UPS beeps continuously.	The UPS transfers to fault mode due to its internal fault.	Please contact the distributor or service center.
The UPS turn into Battery mode.	The voltage or frequency of the utility power is out of the input range of the UPS.	The UPS is running in Battery mode. To save your data and close the application program. Make sure the utility power is within the input voltage or frequency range permitted by the UPS.
The Fault code is "07", the UPS beeps continuously.	The UPS is overloaded or the load equipment is faulty.	Check the loads and remove all no-critical equipment. Recalculate the load power and reduce the number of loads connected to the UPS. Check that the loads are not failed.
The Warning code is "23", the buzzer beeps every second.	The charger of the UPS is defective.	Please contact the distributor or service center.

The Fault code is "11", the UPS beeps continuously.	Battery low or battery not connected.	Check the battery. If the battery is damaged, replace the battery immediately and ensure that the battery breaker is in "ON" position.
The utility power is normal, but the UPS can not turn into Line mode	Maintain switch loose	Please contact the distributor or service center.
Battery discharging time diminishes	Battery not yet been fully charged.	Keep UPS connected to utility power persistently for more than 10 hours to recharge the batteries again.
	UPS overloaded.	Check the loads and remove the non-critical equipment.
	Battery aged.	Replace the batteries. Please contact the distributor to obtain the parts and replacement service.
The UPS cannot power on after pressing the ON button	The ON button is pressed too briefly.	Press the ON button for more than 1 second.
	The UPS is not connected to the battery or the battery pack voltage is too low.	Check the battery or recharge the battery.
	UPS fault.	Please contact the distributor or service center.

When you contact the service center, please provide the following information:

- Model No. and the serial No. of the UPS.
- The date when the problem arose.
- Complete description of the problem, including the LCD display, code, alarm warning, and power condition and load capacity. If your UPS is a long backup time model, you may also provide the information of the external battery pack.

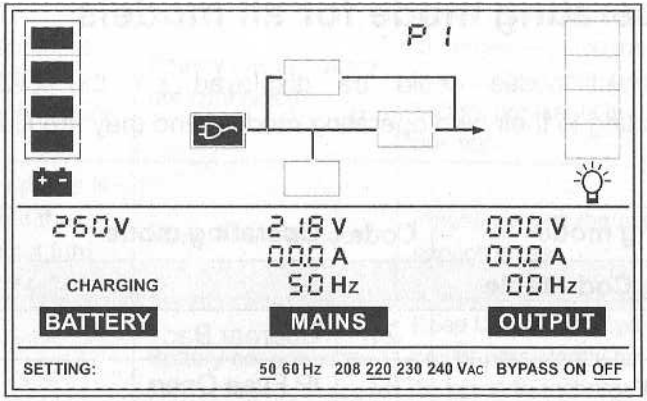
10. Operating mode for all models

The different codes could be displayed on the LCD screen corresponding to their own operating modes, and they are illustrated as the follow:

Operating mode	Code	Operating mode	Code
Warning Code Table			
ID Loss	21	Charger Bad	23
Fan Error	22	IP Fuse Open	24
Fault Code Table			
Bus Fault	05	Bypass STS Short	13
Inverter Fault	06	Battery SCR Short	14
Overload Fault	07	Parallel Communication Fail	15
Over temperature Fault	08	Current Un-share Fault	16
Inverter Short	09	Error Model	17
Communication Fault	10	SCI RX Error	18
Battery Open	11	Negative Output Power Fault	20
Inverter Relay Short	12		

10.1 No Output mode

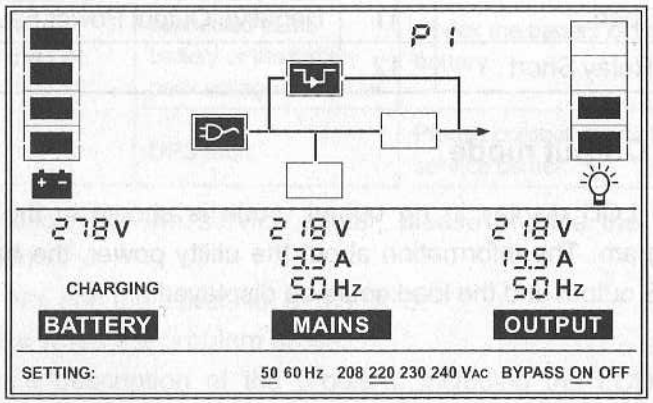
The LCD display in no output mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed.



No Output mode

10.2 Bypass mode

The LCD display in Bypass mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The symbol of "" and "" indicates the bypass is working. The UPS will beep once every 2 minutes in Bypass mode.

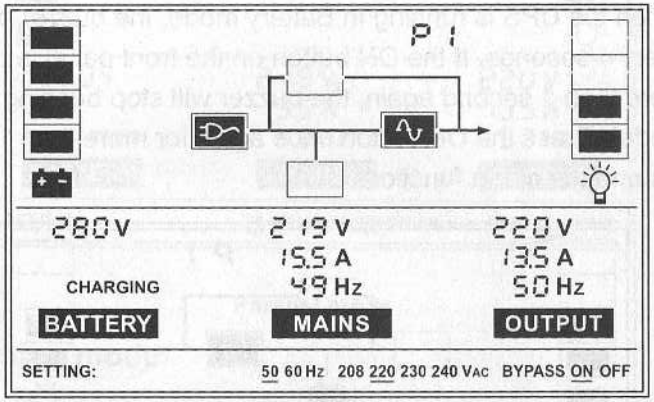


Bypass mode

The UPS does not have the backup function when it is in Bypass mode. The power used by the load is supplied from the utility power via internal filter.

10.3 Line mode

The LCD display in Line mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The symbol of "" and "" indicates the UPS is working in line mode.



Line mode

If output overloaded, the "OVER LOAD" is shown and the UPS will beep twice every second. You should get rid of some unnecessary loads one by one to decrease the loads connected to the UPS less than 90% of its nominal power capacity.

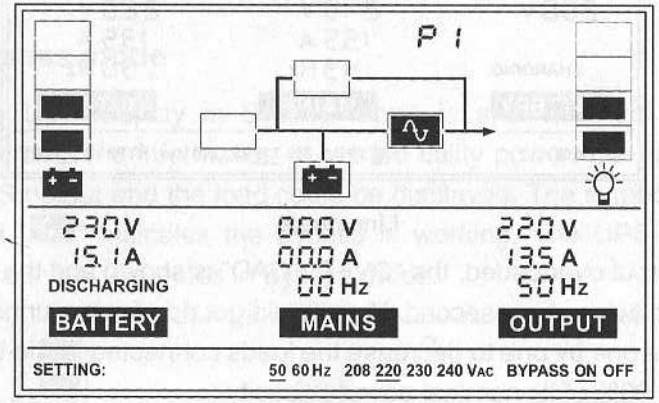
Note: Please follow the following steps to connect the generator :

- Activate the generator and wait until the operation is stable before supplying power of the generator to the UPS (be sure that the UPS is in idle mode). Then turn on the UPS according to the start-up procedure. After the UPS is turned on, then the loads can be connected to the UPS one by one.
- The power capacity of the AC generator should be at least twice of the UPS capacity.

10.4 Battery mode / Battery Test mode

The LCD display in Battery mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The symbol of "[+-]" and "[∿]" indicates the UPS is working in battery mode.

When the UPS is running in Battery mode, the buzzer beeps once every 4 seconds. If the ON button on the front panel is pressed for more than 1 second again, the buzzer will stop beeping (in silence mode). Press the ON button once again for more than 1 second to resume the alarm function.



Battery mode

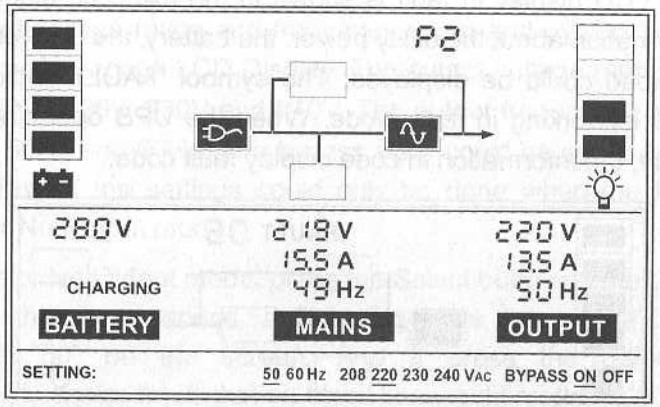
The display of battery test mode is same as Battery mode.

10.5 Parallel mode

The LCD display can show the UPS quantity of the parallel system, and the UPS system that operating in single mode should be regarded as a special parallel system, single mode is a special parallel mode.

The LCD display in parallel mode is shown in the following diagram. When the UPS operating in parallel mode, the information in code display "Pn". The symbol "P" means the UPS

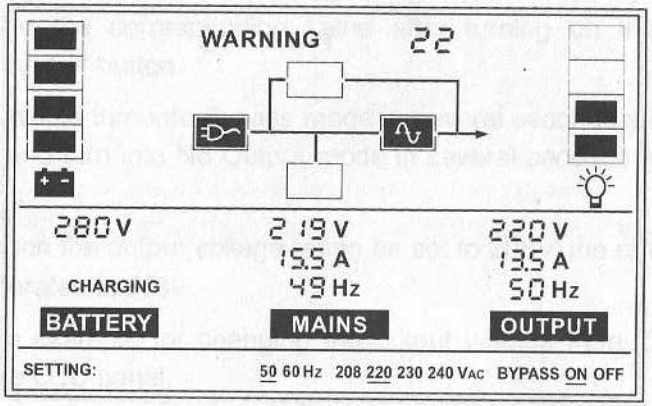
operating in parallel mode, and the number "n" indicate the quantity.



Parallel mode

10.6 Warning mode

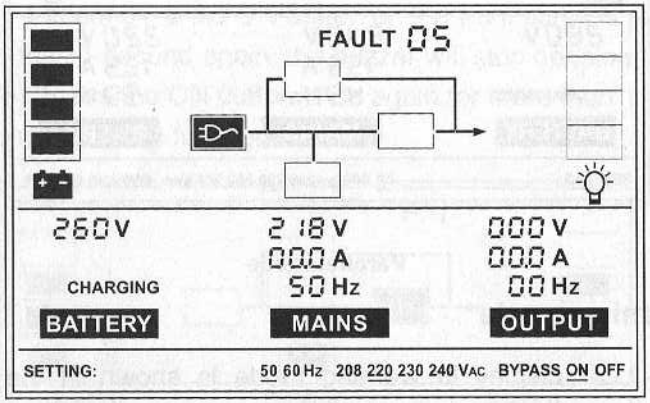
The LCD display in warning mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The "WARNING" indicates the UPS is working in warning mode. When the UPS operating in warning mode, the information in code display alternates between symbol warning code and parallel code.



Warning mode (Fan Error)

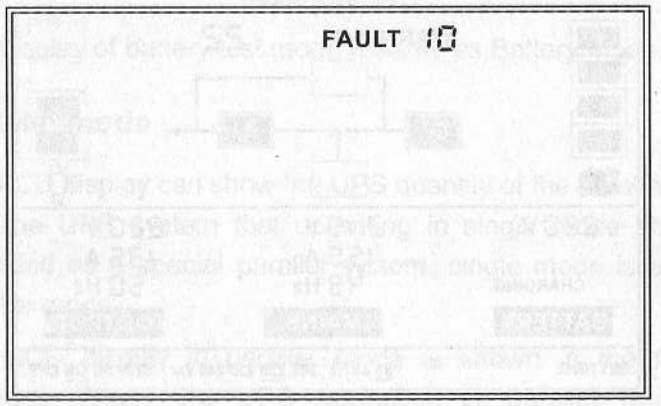
10.7 Fault mode

The LCD display in fault is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The symbol "FAULT" indicates the UPS is working in fault mode. When the UPS operating in fault mode, the information in code display fault code.



Fault mode (Bus Fault)

Note: If mode code is "10", it means that "Inner Communication Fault", and all the information of the UPS have not be shown except fault code information, like the following diagram.



Communication Fault mode

11. Setting by LCD Module

The output voltage rating and frequency rating and bypass state could be set directly through LCD Display. The output voltage rating could be set to 208V*, 220V, 230V and 240V. The output frequency rating could be set to 50Hz and 60Hz. The bypass state could be set to enable and disable. But all the settings could only be done when the UPS is in Bypass or No Output mode.

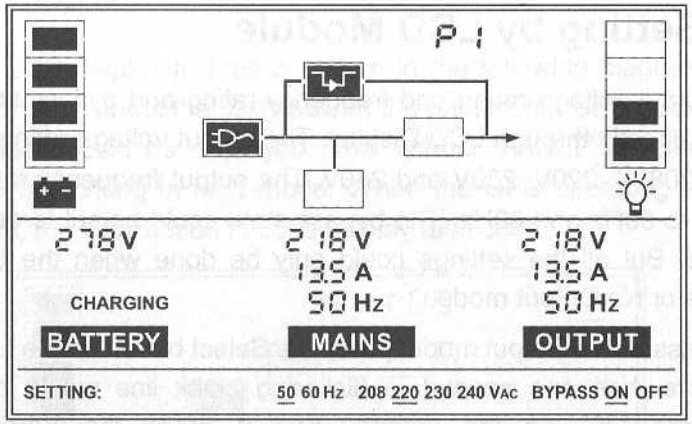
In Bypass or No Output mode, press the Select button on the LCD panel for more than one second, a flickering black line would be shown underside "50" on the screen. And if press the Select button continuously again, the flickering black line would move to "60", next to around "208", "220", "230", "240", "ON", "OFF" in turn. And if press the Enter button for more than one second at this time, the flickering black line would turn to flicker less and the output voltage rating or frequency rating or bypass state setting would be modified to the selected value. And if no any pressing on the Select or Enter button lasting for more than ten seconds, the flickering black line would disappear, no setting have be modified.

The only one voltage rating could be selected in "208", "220", "230", "240" at any time, only one frequency rating could be selected in "50", "60" at any time, and the output voltage and frequency would be changed to the corresponding value after turning on the UPS by pressing the ON button.

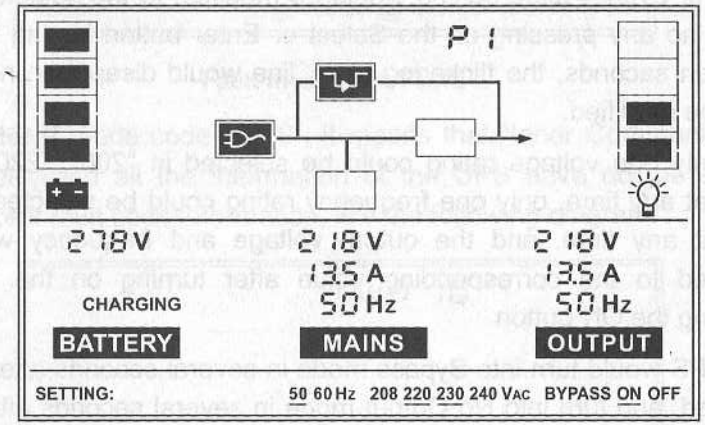
The UPS would turn into Bypass mode in several seconds after "ON" is selected, and turn into No Output mode in several seconds after "OFF" is selected.

***Note**: When the output voltage rating be set to 208V, the output power must be derated to 90%.

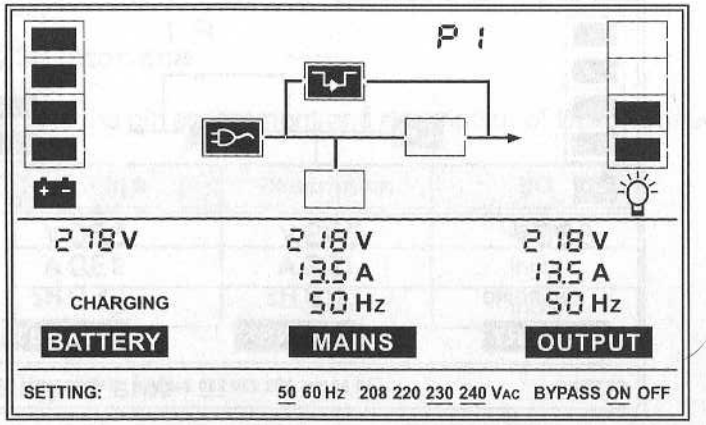
Here is an example for changing the output voltage from 220 to 230 through the LCD panel.



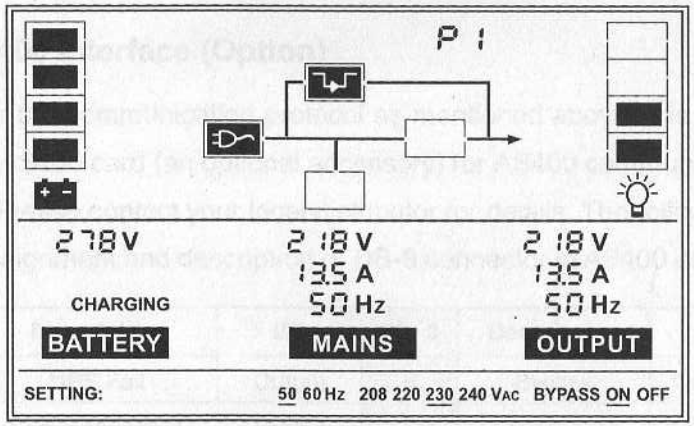
STEP 1: One flickering black line would appear underside "50" after pressing the Select button.



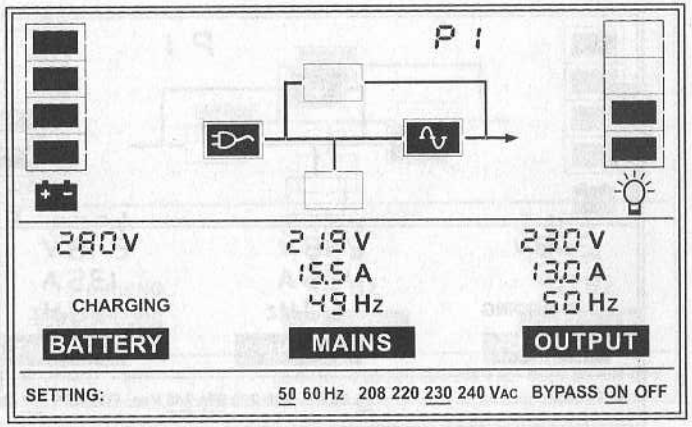
STEP 2: The flickering line would move to underside "230" after pressing the Select button four times again.



STEP 3: The line underside "230" would turn to flicker less after pressing the Enter button, and the flickering line would move to the next "240".



STEP 4: The output voltage rating have been modified to "230", and UPS work in Bypass mode.



STEP 5: The output voltage would be 230VAC after the UPS is turned on.

12. Communication Port

12.1 RS232 Interface

The following is the pin assignment and description of DB-9 connector.

Pin #	Description	I/O
2	TXD	Output
3	RXD	Input
5	GND	Input

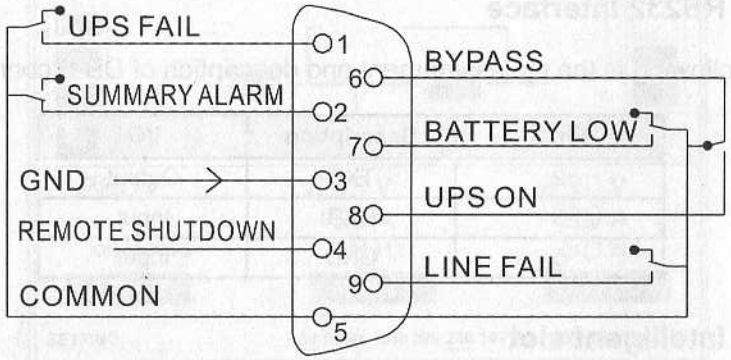
12.2 Intelligent slot

This series is equipped with an intelligent slot for Webpower (optional accessory) or other optional card to achieve remote management of the UPS through internet / intranet. Please contact your local distributor for further information.

12.3 AS400 Interface (Option)

Except for the communication protocol as mentioned above, this series UPS has AS400 card (an optional accessory) for AS400 communication protocol. Please contact your local distributor for details. The following is the pin assignment and description of DB-9 connector in AS400 card.

Pin #	Description	I/O	Pin #	Description	I/O
1	UPS Fail	Output	6	Bypass	Output
2	Summary Alarm	Output	7	Battery Low	Output
3	GND	Input	8	UPS ON	Output
4	Remote Shutdown	Input	9	Line Loss	Output
5	Common	Input			

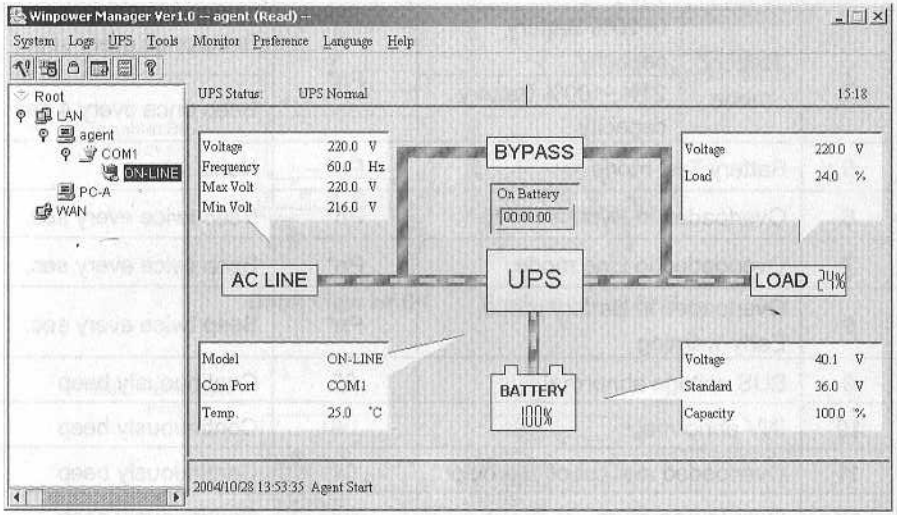


DB-9 Interface of AS400 communication protocol

13. Software for all models

Free Software Download – WinPower

WinPower is a brand new UPS monitoring software, which provides user-friendly interface to monitor and control your UPS. This unique software provides safely auto shutdown for multi-computer systems while power failure. With this software, users can monitor and control any UPS on the same LAN no matter how far from the UPSs.



Installation procedure:

1. Go to the web site:
   http://www.ups-software-download.com/winpower.htm
2. Choose the operation system you need and follow the instruction described on the website to download the software.
3. When downloading all required files from the internet, enter the serial No: **511C1-01220-0100-478DF2A** to install the software.

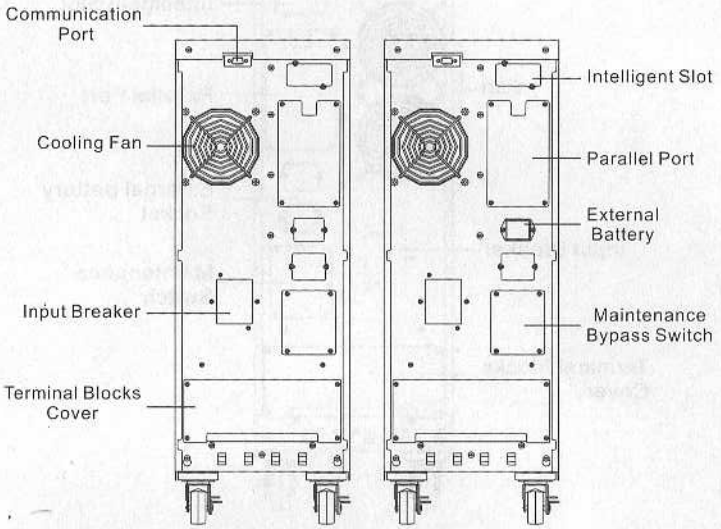
When your computer restarts, the WinPower software will appear as a green plug icon located in the system tray, near the clock.

Appendix 1: The Corresponding Form of the LCD Display

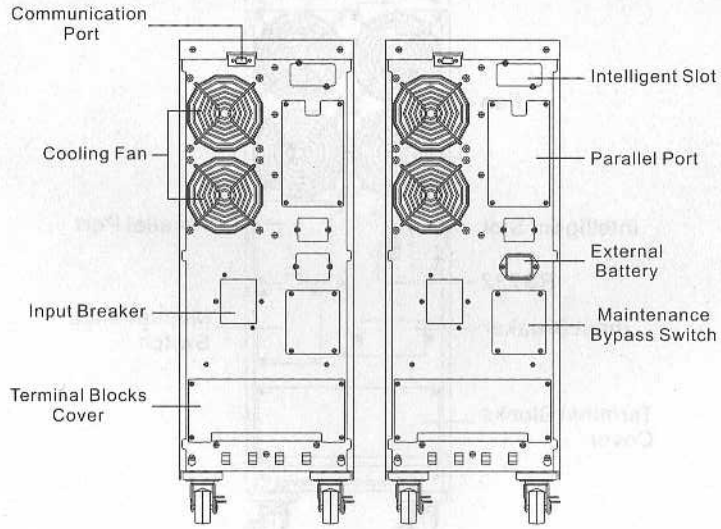
No.	Operating state		LCD Code Display	Alarm warning
1	No Output mode		Pn*	None
2	Bypass mode		Pn*	Beep once every 2 min.
3	Line mode		Pn*	None
4	Battery mode	0~20% Battery capacity	Pn*	Beep once every sec
		21%~100% Battery capacity		Beep once every 4 sec
5	Battery Test mode		Pn*	None
6	Overloaded in Bypass mode		Pn*	Beep twice every sec.
7	Overloaded in Line mode		Pn*	Beep twice every sec.
8	Overloaded in Battery mode, Early-warning		Pn*	Beep twice every sec.
9	BUS voltage abnormal		05	Continuously beep
10	INV abnormal		06	Continuously beep
11	Overloaded and cut off the output		07	Continuously beep
12	Over temperature		08	Continuously beep
13	Output short circuited		09	Continuously beep
14	Communication abnormal		10	Continuously beep
15	Battery open		11	Continuously beep
16	INV relay failed		12	Continuously beep
17	BAT SCR failed		14	Continuously beep
18	Parallel abnormal		15	Continuously beep
19	ID abnormal		21	Beep once every 10 sec
20	Fan abnormal		22	Beep once every sec
21	Charger and battery failed		23	Beep once every sec

*__Note__: Pn indicate the quantity of the parallel system

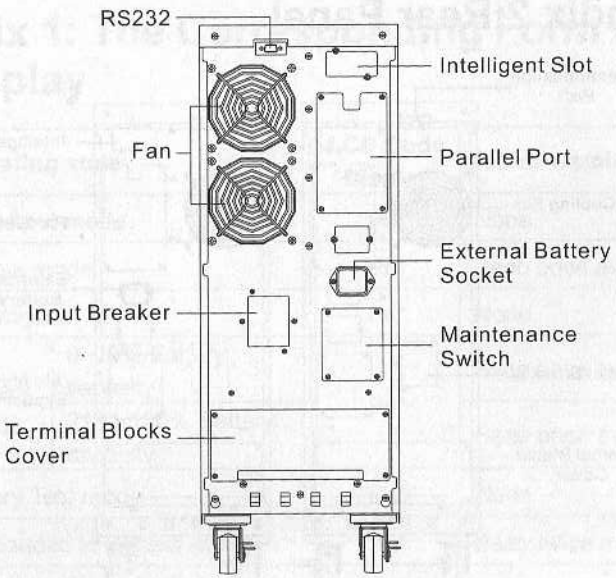
Appendix 2:Rear Panel



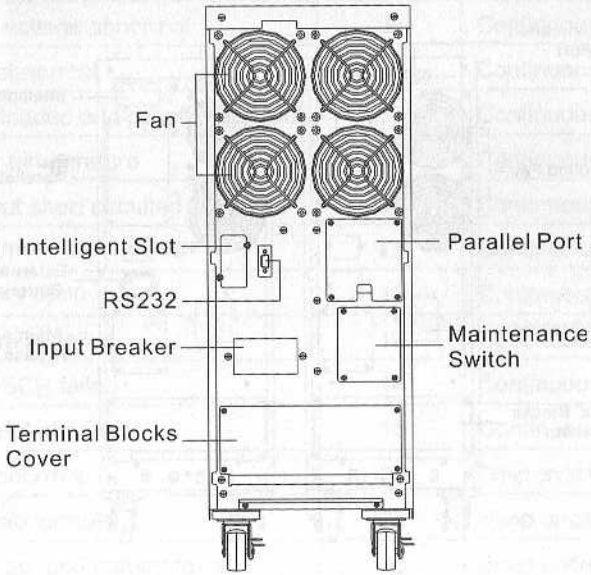
Back view of 6K **Back view of 6KS**



Back view of 10K **Back view of 10KS**



Back View of 3T1 10KS



Back View of 3T1 15KS/20KS